



## Teacher's Guide

# Red Imported Fire Ants

Facts About These Interesting  
Insects



An educational resource  
for teaching second and  
third grade students,  
provided by the  
California Foundation  
for Agriculture in the  
Classroom in partnership  
with the California  
Department of Food  
and Agriculture.

# A Teacher's Guide to Educating Students About Red Imported Fire Ants

This booklet is designed to provide teachers with facts and activities to teach children about the Red Imported Fire Ant, a potentially dangerous and destructive insect to the people, animals, and plants of California.



Red Imported Fire Ant  
(magnified).

## Why Teach About Red Imported Fire Ants?

Red Imported Fire Ants are tiny but aggressive reddish-brown ants with a fierce sting.

They are one of the few pests that are dangerous in urban settings, on agricultural lands, and in natural habitats. They are not native to the United States, but since their introduction to this country in the 1930s, they have had a substantial impact on people, animals, and agriculture.

Because of the aggressive nature of these ants, safety for all California's residents is a concern. It is important for both adults and children to understand the Red Imported Fire Ants' behavior and learn how the ants impact our world, so people can avoid being injured by Red Imported Fire Ant stings.

This teacher's guide is designed to help educate students on the basic biology of Red Imported Fire Ants, learn how they are similar to other ants, understand why they are dangerous, and inform children of the steps they can take to protect themselves and others.

A Red Imported  
Fire Ant nest.



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# Red Imported Fire Ant



## Not Just Another Ant

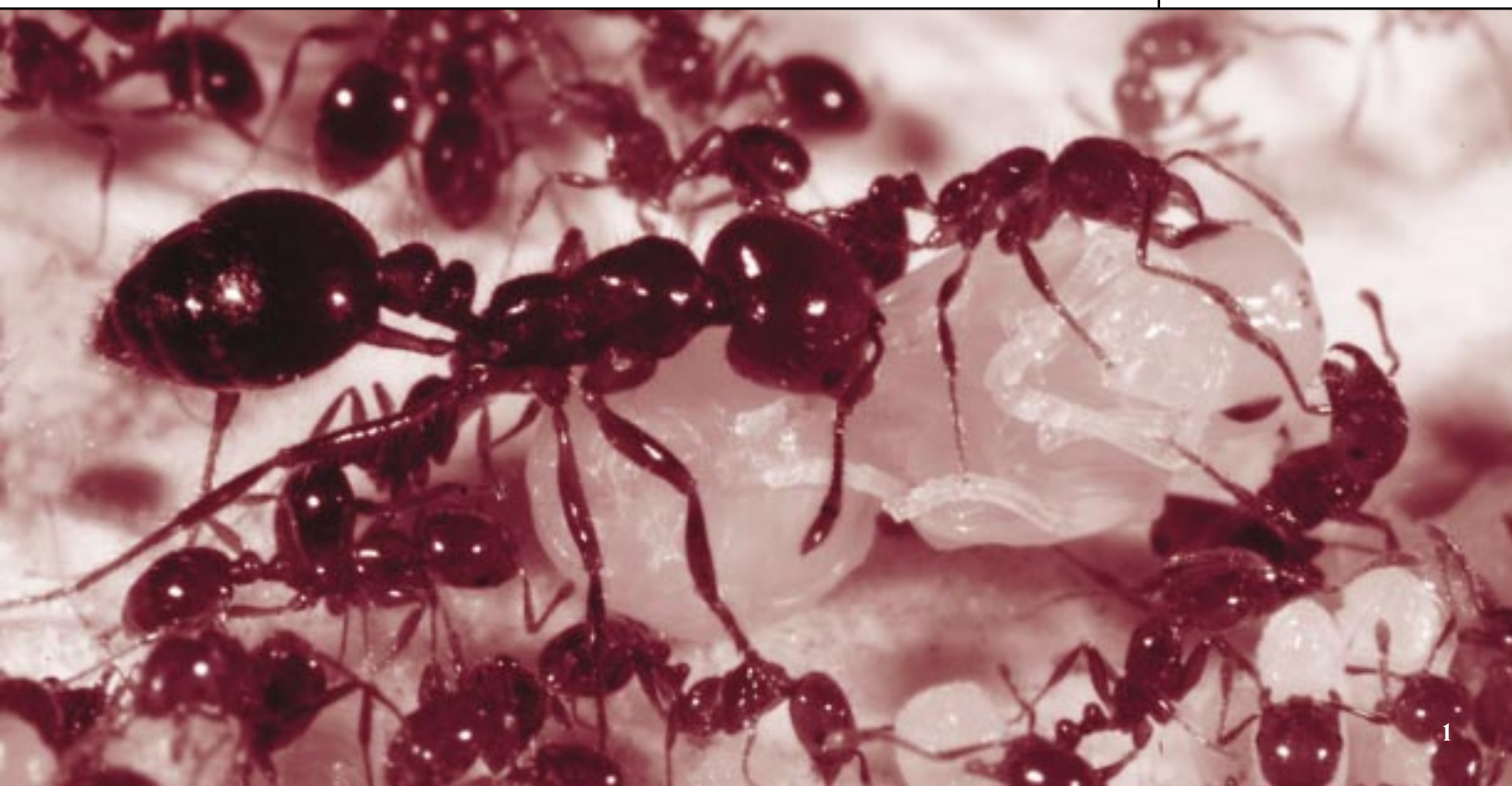
The Red Imported Fire Ant, whose scientific name is *Solenopsis invicta*, was named “invincible” by scientists because of the ant’s aggressive behavior and the painful stings it inflicts.

Red Imported Fire Ants are called “imported” because they are not native to the United States. It is believed they came to this country from South America in the early 1930s aboard cargo ships. Now they are widespread throughout 11 southeastern states and have moved into the southwestern portion of the United States, including parts of California.

Red Imported Fire Ants are 1/16- to 1/4-inch in length and reddish-brown in color. They are extremely aggressive in behavior and usually produce mounds of soft, crumbly soil that contain their colonies. When these colonies are disturbed by ground vibrations from footsteps, flooding from watering, or exposure to sunlight, the worker ants will “boil out” of the mound, swarm over a victim, and sting repeatedly.

The ant stings by first firmly grasping the victim’s skin with its jaws and then stinging the skin by injecting venom from its stinger, which is located at the end of the ant’s abdomen. Each Red Imported Fire Ant can sting multiple times. Its venom is unique because of the high concentration of toxins it contains. This causes a burning sensation at the sting site.

Worker ants tending  
a pupa (immature ant).





### DID YOU KNOW...

A Red Imported Fire Ant, in its immature stages, will rock back and forth to draw attention to itself.

This photo shows how tiny the Red Imported Fire Ant can be. It is resting on the tip of a pencil.



# The Life Cycle of the Red Imported Fire Ant

## The Colony

Within the Red Imported Fire Ant society, there are different classes of ants, called castes. Each of the different types of ants — wingless females, winged females, and males — has a specialized role. Each ant is faithful in its role to ensure the survival of the colony.

As in other ant colonies, the wingless, infertile, female Red Imported Fire Ant workers are dominant. They have several roles: to defend the colony, build the mound, forage for food, and tend the brood of immature ants known as larvae. The work of the ants within and outside of the colony is dictated by the needs of the queen and the brood. There are major and minor workers, and they are differentiated by head size.

Workers tend larvae throughout their growth stage. The immature ants are fed, cleaned, and protected by adult workers. Red Imported Fire Ant eggs are either male or female. The type of care and feedings the female larvae receive from the worker ants will determine whether the ant will have wings or not. Winged females are potential queens. Wingless females will be workers. All male Red Imported Fire Ants have wings. They do not work for the colony and exist only for reproduction. Males are the shortest living of the castes.

The average Red Imported Fire Ant colony contains 100,000 to 500,000 workers and up to several hundred winged ants and queens. Queen ants can live six years or more. Worker ants generally live about five weeks.

## Reproduction

The Red Imported Fire Ants' life cycle begins with mating flights. When the climate is right (generally after a rain or watering, when the temperature is greater than 70 degrees and the sun is shining), male ants leave the nest and swarm in the air. Shortly afterward, winged females leave the nest and also fly. The ants may release pheromones that help the other sex find them in flight, and they mate while still flying. Within a short period of time, both sexes fall to the ground and the males die almost immediately. The female — now a mated queen — removes her wings and begins the process of starting a new colony. The new queen tends and feeds the first eggs she lays until they mature. After this, the queen's only job is to lay eggs. The queen now depends on worker ants to care for and feed her. The eggs develop into white larvae, then pupae, and eventually adults. The development from egg to adult averages about 30 days.



Behavior and mound shape, rather than appearance, most often help identify Red Imported Fire Ants.

# Mounds

## Where Red Imported Fire Ants LIVE!

It is important to understand that the identification of Red Imported Fire Ants by their appearance is best left to experienced biologists. **You should never approach a Red Imported Fire Ant colony.** However, certain characteristics can help you identify Red Imported Fire Ants without having to get near them. One way is by knowing what their mounds or colonies look like.

## What Do Red Imported Fire Ant Mounds Look Like?

Unlike other ants native to California, Red Imported Fire Ants build mounds, also called nests, with more than one central opening into the colony. These mounds have extensive tunneling systems. Red Imported Fire Ant mounds in California look different from fire ant mounds found in the southeastern U.S. In the Southeast, mounds typically look like those of a busy gopher, with crumbly soil piled up to 18 inches high. In California, most Red Imported Fire Ant mounds aren't really mounds at all. In fact, they look more like flat patches of soil. These low mounds primarily occur when the colony is immature, or because lawn mowing or other disturbances have knocked down the mounds.

Typically, Red Imported Fire Ants build nests just about anywhere they can find moisture, such as lawns, gardens, woodpiles, fields, golf courses, and parks. Mounds can also be located in rotting logs and around stumps of trees. Colonies have been found in the wall cavities of buildings and below the foundations of homes and other buildings.

Red Imported Fire Ants frequently infest electrical equipment, chewing on insulation and causing short circuits. They nest in electrical and utility boxes, too. They are known to move soil into these structures, which can cause shorting and mechanical problems and can interfere with switching mechanisms. The pests can damage air conditioners, traffic signal boxes, pool pumps, and other devices.



## DID YOU KNOW...

Red Imported Fire Ants have a stinger on their abdomen that releases venom, which causes a burning sting. These ants can sting more than once.



A Red Imported Fire Ant colony that has infested electrical equipment.

Colonies frequently migrate from one site to another in search of food and better conditions. A queen needs only about six workers to start a new colony. Almost overnight, the workers can develop a new mound several hundred feet away from their previous location.

Because of this, Red Imported Fire Ants are a threat to wildlife and agriculture. They can attack agricultural workers, compete with beneficial insects, and devour important crops, such as citrus, strawberries, and corn. The ants also attack and kill wildlife such as quail, lizards, squirrels, and baby deer. In Texas, more than \$580 million is spent each year just to control, not eradicate, Red Imported Fire Ants.

## What Do Experts Do When a Mound is Discovered?

The current goal of the California Department of Food and Agriculture is to eradicate all Red Imported Fire Ants from California. Since the insects are not native to California, scientists decided that eradication should be the primary goal while the population of Red Imported Fire Ants is developing. It is believed that the population of Red Imported Fire Ants can be eliminated with the current procedures.

The California Department of Food and Agriculture uses an eradication process that consists of two types of chemicals — an insect growth regulator (IGR) and a metabolic inhibitor (MI), which are applied as baits. Both products are mixed with ground corncobs and soybean oil, a combination that is designed to attract Red Imported Fire Ants. Working together, these chemicals may eradicate an entire colony in several weeks. The slow-acting characteristics of these chemicals are preferred because Red Imported Fire Ants are able to take the baits into the nest and distribute them to other workers and the queen before they die.

If you think you may have found Red Imported Fire Ants, call the toll-free number, 1-888-4FIREANT (1-888-434-7326), to report your findings. An adult should make this call.



# ALERT!

**PROTECT YOURSELF BY REPORTING  
TOLL FREE 1-888-4FIREANT**

**1-888-434-7326**

CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE










# How Can You Stay Safe?

***Note to Teachers:** The threat to people and animals is a factor that distinguishes Red Imported Fire Ants from other ants. Although many other types of ants, both imported and native, are merely a nuisance, Red Imported Fire Ants have a fierce sting that leaves victims with painful, itchy welts or blisters. Stings from Red Imported Fire Ants jeopardize the health of people who are allergic to the ants' venom, and, in rare instances, can be life threatening. Red Imported Fire Ants are particularly dangerous to small children, the elderly, pets, and wildlife.*

Because any presence of Red Imported Fire Ants can be potentially dangerous, it is important to inform children of the health dangers and teach them how to protect themselves and their family members from being stung. The following basic health and safety messages should be shared with children, parents, and when appropriate, the school's health officer or school nurse.

## **I Suspect That I've Found Red Imported Fire Ants . . .**

### What should I do?

-  Do not disturb the mound or area.
-  Keep people and pets away from the potential infestation.
-  Do not treat the area yourself with any type of chemical.
-  Call the toll-free number, 1-888-4FIREANT (1-888-434-7326), and report your observations.
-  Remain calm.



### **DID YOU KNOW...**

Red Imported Fire Ants look similar to other types of ants — they are 1/16- to 1/4-inch in length.

# Safety for Kids

## What Should Be Done If I Get Stung?

If you are stung by Red Imported Fire Ants, let an adult know where on your body you were stung, and where it happened. Another person should be informed to assist with first aid, if necessary. The following treatments may help alleviate the pain and help prevent infection:

- Seek medical attention **immediately** if you suspect an allergic reaction. An allergic reaction includes severe swelling, shortness of breath, dizziness, nausea, headaches, and sweating.
- If possible, elevate the area of the body that was stung and apply ice or a cold compress to reduce swelling and relieve pain and itching.
- Wash the affected area with soap and water to prevent infection.
- Keep blisters clean and avoid scratching to reduce the chance of infection and scarring.
- Call the toll-free number, 1-888-4FIREANT (1-888-434-7326), and report the incident. An adult should make this call.
- Seek medical attention if swelling progresses or an area becomes infected.

## How Can I Avoid Getting Stung?

- Wear closed-toe shoes with socks when walking in grass.
- Wear gloves when digging in dirt.
- Survey the area and look for Red Imported Fire Ants before playing.
- Do not go near or disturb areas that have any type of ant mound.

Sores resulting from multiple stings from a Red Imported Fire Ant.





# Build Your Own ANT

Science/  
Mathematics  
Activity

## Teacher's Instructions

**Purpose:** To learn the anatomy of the Red Imported Fire Ant while reviewing addition and subtraction facts.

**Before You Start:** Photocopy one *My Red Imported Fire Ant* coloring page for each student and one *Red Imported Fire Blackline Master*. Locate dice and other needed materials.

**Time:** 30 minutes

**Materials:** One pair of dice per group

*Red Imported Fire Ant Blackline Master*, one per group

*My Red Imported Fire Ant* coloring page, one per person

Crayons or markers, one set per group

## Doing the Activity:

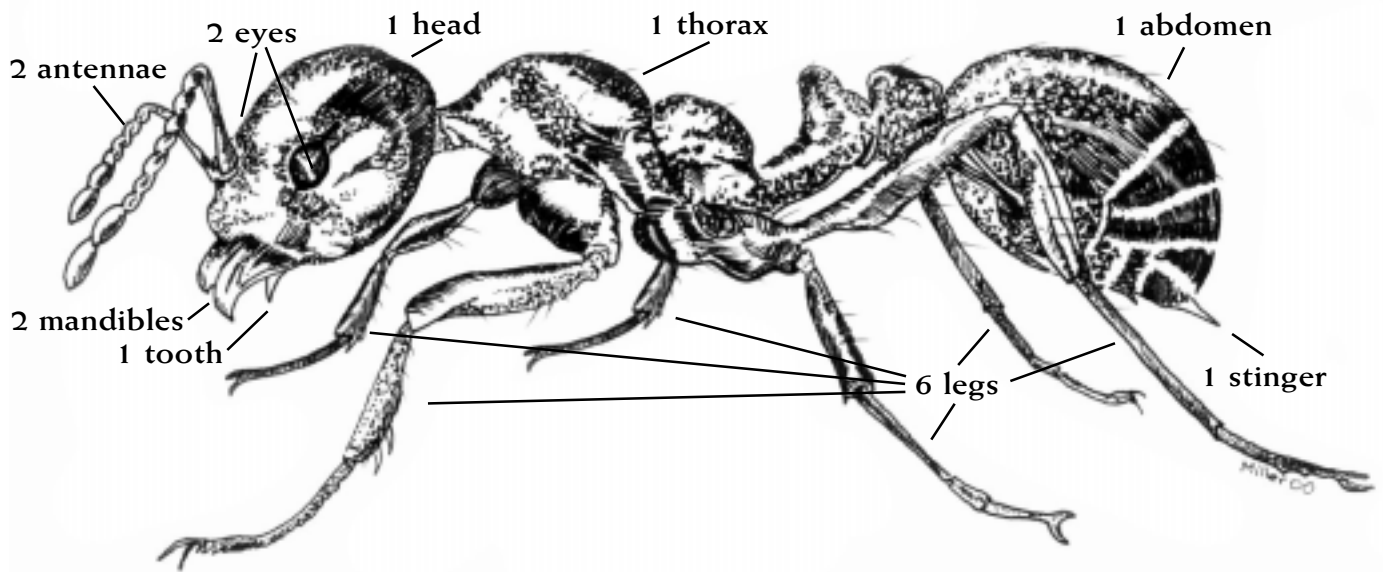
- 1) Review the basic anatomy of ants by showing students the drawing of the Red Imported Fire Ant. Discuss that all insects have three main body sections — the head, abdomen and thorax; they also have six legs and two antennae. Discuss what anatomical parts make Red Imported Fire Ants unique — the stinger and the tooth.
- 2) Explain the game rules to the students.

### Game Rules

- Form teams of 2-4 players. Distribute a *My Red Imported Fire Ant* coloring page to each player. Each team should have one pair of dice, one set of coloring crayons or markers, and one *Red Imported Fire Ant Blackline Master*.
- Roll one dice to see who goes first. The person who rolls the highest number will go first. The players take turns clockwise.
- First player rolls a pair of dice. Player can either add or subtract the numbers on the dice to get a total. Using the key on the *My Red Imported Fire Ant* coloring page, the player determines which part of the ant can be colored on his/her page. The player must verbalize the addition or subtraction problem and announce to the group which part will be colored. The other players should verify the answer before the player colors in the section of the ant.
- Play continues with each person. The first person to completely color in his/her ant is the winner!

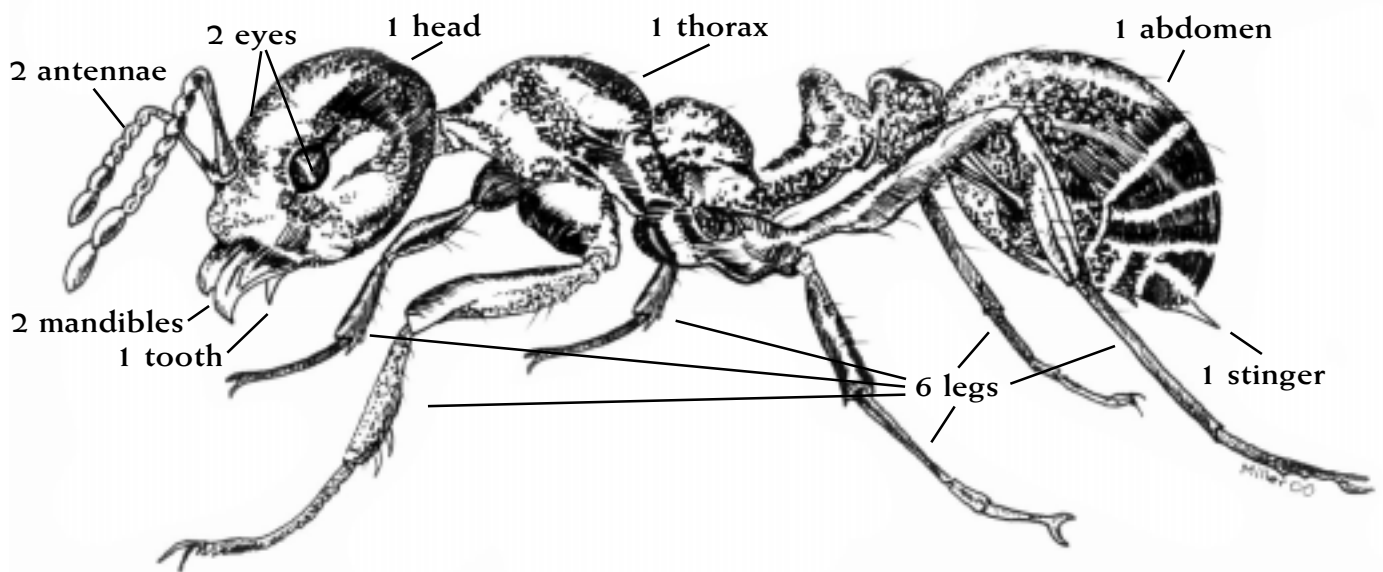
- 3) After the game, display the colorful ant pictures.

# Red Imported Fire Ant



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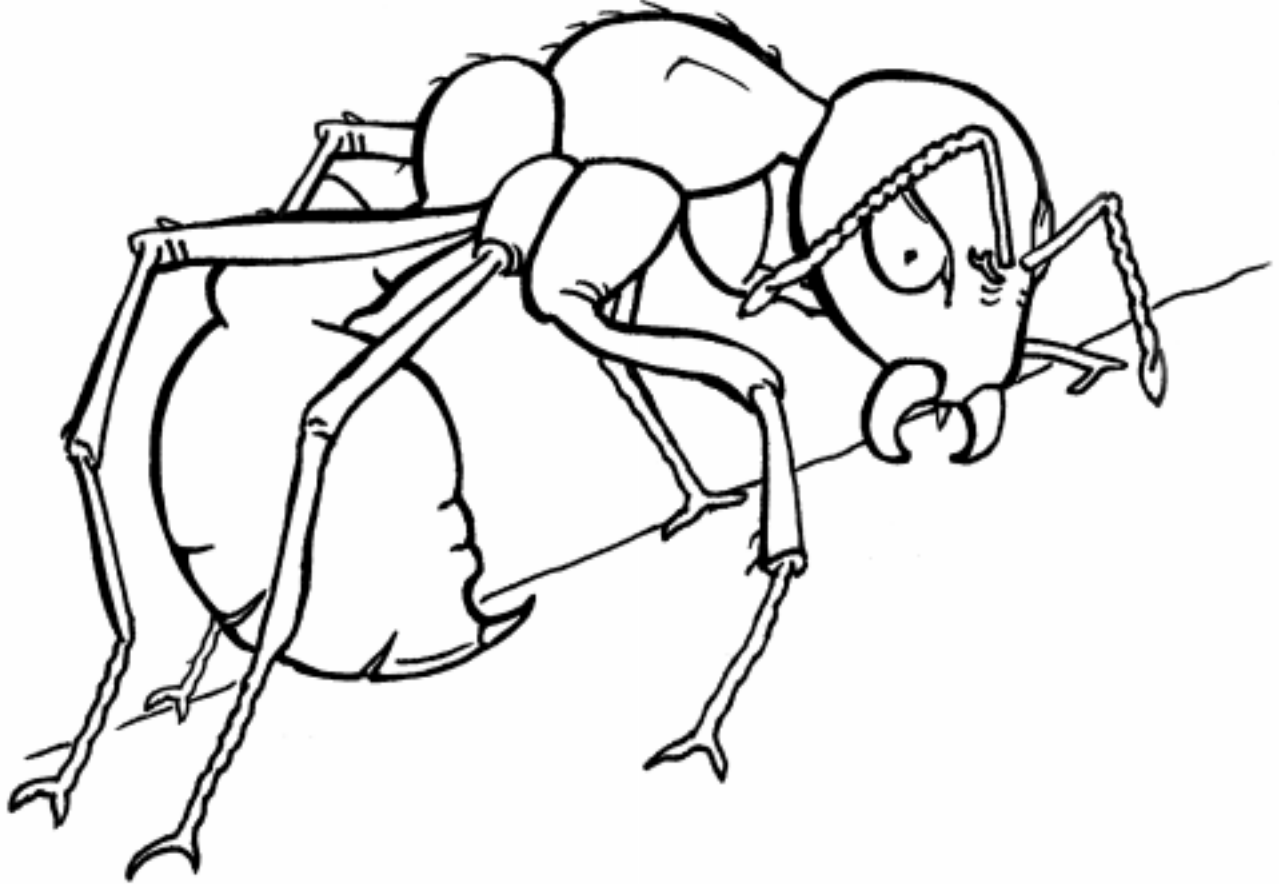
# Red Imported Fire Ant



Name \_\_\_\_\_

# My Red Imported Fire Ant

Directions: Take turns rolling the dice. Add or subtract the numbers on the dice to get a total. Use the key at the bottom of the page to see what part of the Red Imported Fire Ant you can color. Whoever colors their ant first is the winner! Have fun!



If you add or subtract and get the total of:	You may color in one:	To complete your ant, you must color in:
1	Abdomen	1 Abdomen
2	Leg	6 Legs
3	Thorax	1 Thorax
4	Antenna	2 Antennae
5	Mandible	2 Mandibles
6	Eye	2 Eyes
7	Tooth	1 Tooth
8	Stinger	1 Stinger
9	Head	1 Head



# Red Imported Fire Ant Crossword Puzzle

Reading/  
Language Arts/  
Science Activity



## Teacher's Instructions

**Purpose:** To reinforce Red Imported Fire Ant facts and expand student vocabulary.

**Before You Start:** Photocopy crossword puzzle on page 11 and student reading on page 12, *Let's Get the Facts on Red Imported Fire Ants*. It might be useful to have each page copied on a separate sheet of paper.

**Time:** 30 minutes

**Materials:** *Red Imported Fire Ant Crossword Puzzle*, one per student

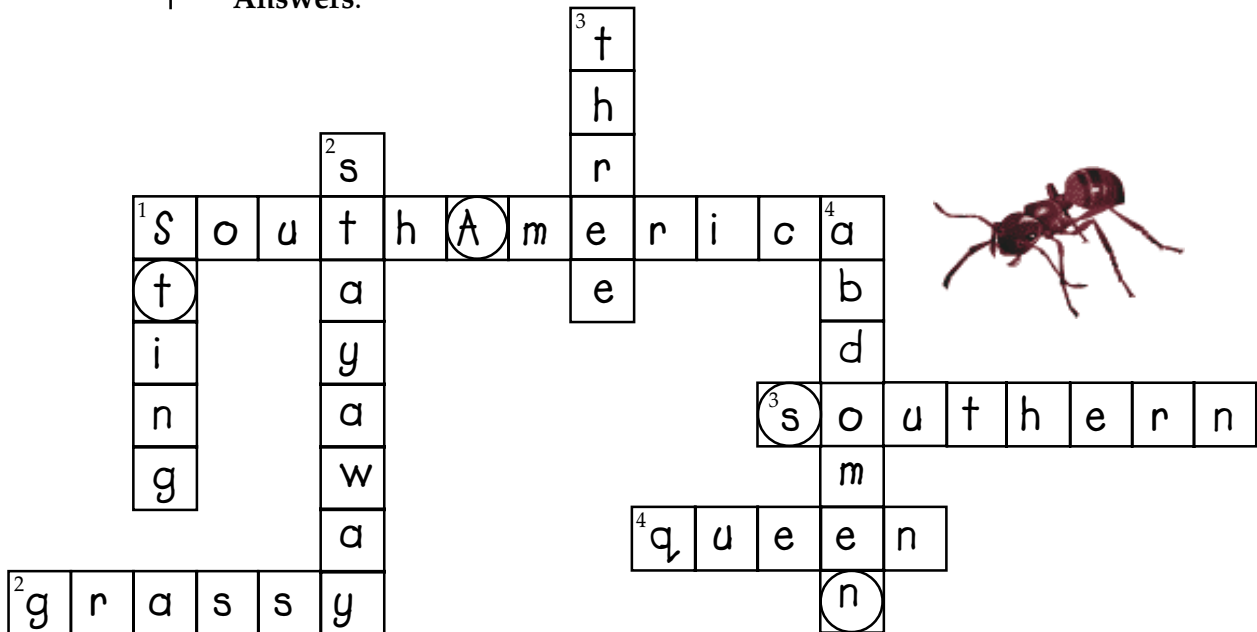
*Let's Get the Facts About Red Imported Fire Ants*, one per student

Pencils, one per student

### Doing the Activity:

- 1) Orally read *Let's Get the Facts About Red Imported Fire Ants*. Discuss the meaning of each bold word.
- 2) Distribute a *Red Imported Fire Ant Crossword Puzzle* to each student.
- 3) Have students complete the puzzle.

**Answers:**



Secret Word

(a)(n)(t)(s)

Unscramble the circled letters to find the secret word.

Name \_\_\_\_\_

# Red Imported Fire Ant Crossword Puzzle

Directions: Fill in the blanks in the list of clues. Then place these words into the crossword puzzle.

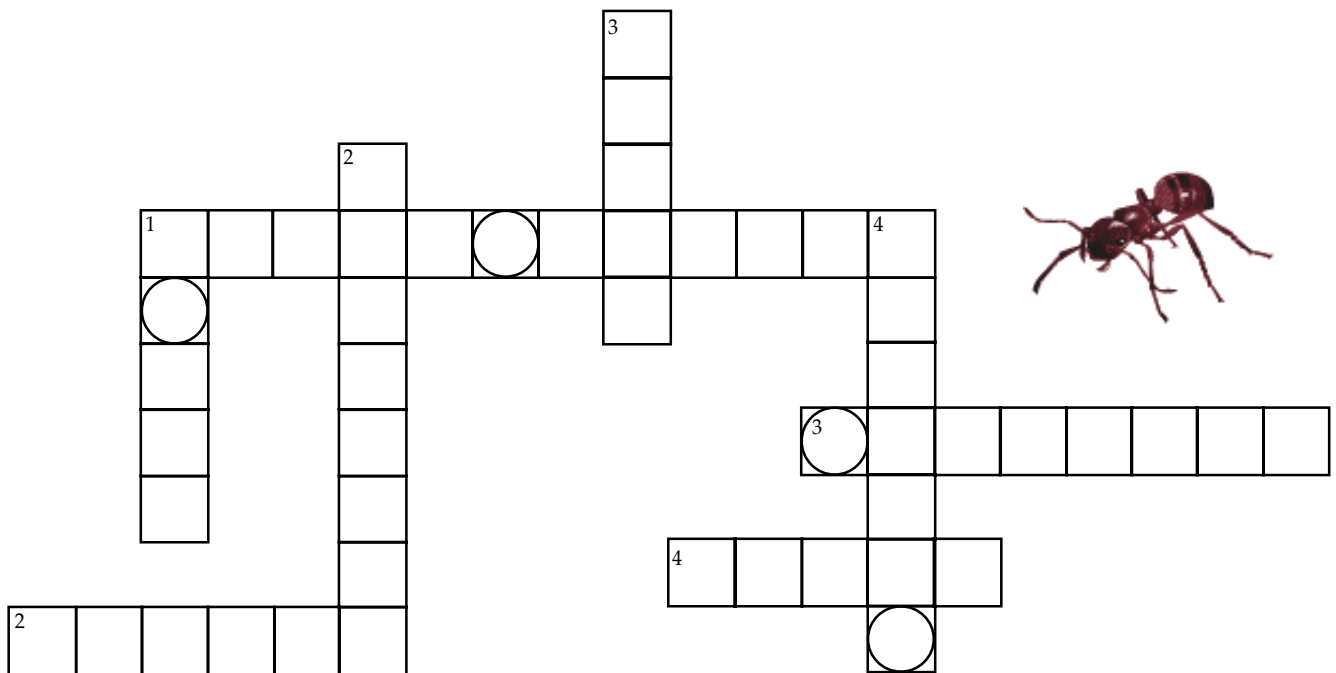
## Clues

### Across

1. Red Imported Fire Ants are called imported because they are thought to have come from \_\_\_\_\_.
2. Red Imported Fire Ants are sometimes found in electrical equipment but most often are found in \_\_\_\_\_ areas.
3. Red Imported Fire Ants are common in \_\_\_\_\_ California.
4. A \_\_\_\_\_ ant lays eggs.

### Down

1. If disturbed, Red Imported Fire Ant workers \_\_\_\_\_.
2. If I find a large ant nest, I should \_\_\_\_\_ and tell an adult.
3. Ants have \_\_\_\_\_ main body sections.
4. A Red Imported Fire Ant has a stinger on its \_\_\_\_\_.



Secret Word

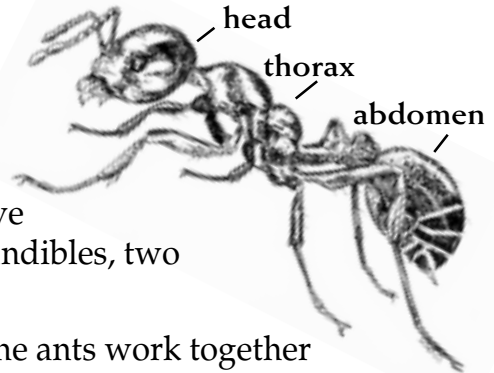


Unscramble the circled letters to find the secret word.

# Let's Get the Facts on Red Imported Fire Ants

Ants can be found almost everywhere — sidewalks, gardens, school playgrounds, and in the woods. Sometimes we find them where we would rather not see them, like in our homes or in our cupboards.

Ants belong to a group of animals called insects. All insects have **three** main body sections — a **head**, **thorax**, and **abdomen**. They also have two eyes, two mouthparts called mandibles, two antennae, and six legs.



Ants are social insects. This means the ants work together in colonies. Each colony has at least one winged **queen** who lays eggs, wingless female workers who care for the colony, and winged males who are needed for reproduction.

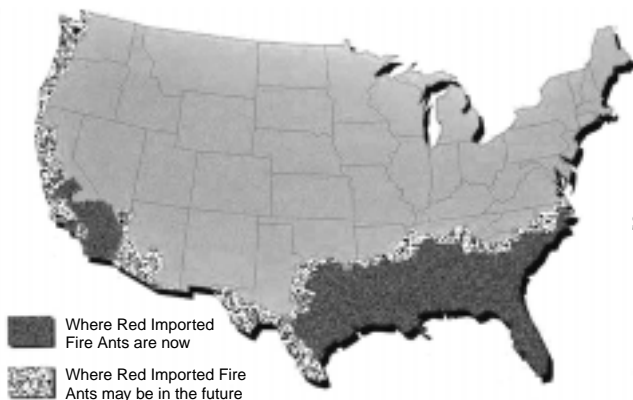
Termites, bees, and wasps are also social insects.

Red Imported Fire Ants are one of many kinds of ants. The ants got their name because they are: reddish brown (*Red*), they are not originally from the United States (*Imported*), and they can give a burning **sting** from the stinger on their **abdomen** (*Fire*).

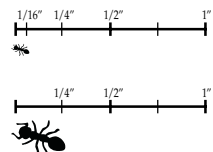
People think that Red Imported Fire Ants came to the United States on ships from **South America** in the early 1930s.

Red Imported Fire Ants can be very dangerous to people and other animals. If their ant mounds are disturbed, the worker ants will “boil out” of the mound and sting the animal that bothered them.

Right now, the ants have been spotted in **Southern California**. It is best to **stay away** from ant mounds and to show an adult if you see a lot of ant mounds or a large ant mound in a **grassy** area, like a park or school field.



Red Imported Fire Ants look similar to other types of ants — they are 1/16- to 1/4-inch in length.





## More Lesson Ideas

- Cut out pictures of places Red Imported Fire Ants may live. Make a collage.
- Make posters explaining how to protect yourself from Red Imported Fire Ants and what should be done if a Red Imported Fire Ant mound is suspected. Use the 1-888-4FIREANT (1-888-434-7326) phone number on the poster.
- Write a story with an ant as the main character.
- Study social insect colonies. Create a mural depicting the information learned.
- Draw a picture of the life cycle of ants. Add dimension by using materials such as egg cartons, cotton balls, beads, and cellophane.
- Make ants out of egg cartons.



## Letter to Parents

Dear Parent:

Today your child learned about Red Imported Fire Ants. You may already be aware of this destructive and potentially dangerous ant that has been found in California.

You and your family could be at risk. These tiny but aggressive ants have a fierce sting that leaves victims with painful, itchy welts. In some cases, stings from Red Imported Fire Ants can cause severe reactions, even death, in people who are allergic to the ants' venom.

Red Imported Fire Ants usually nest in grassy areas but can be found in walls of homes, as well. They will swarm onto animals and people who disturb their colonies within a matter of seconds and inflict painful stings. Each sting itches and burns and leaves a blister-like sore that could become infected if not treated carefully. Red Imported Fire Ants are especially dangerous to small children, the elderly, pets, and wildlife.

If you think you've found a Red Imported Fire Ant mound or nest, **don't disturb it!** Instead, call the California Department of Food and Agriculture (CDFA) toll free at 1-888-4FIREANT (1-888-434-7326). They will ask you questions to determine whether you have discovered a Red Imported Fire Ant infestation and will send an expert at no charge to inspect it and, if necessary, treat it. **Do not try to kill the ants or destroy the nest yourself.**

Protect your family and yourself by being on the lookout for Red Imported Fire Ants — at work and at home. With your help, we can rid California of this unwanted pest. For more information on Red Imported Fire Ants, visit [www.fireant.ca.gov](http://www.fireant.ca.gov).

Regards,

The California Department of Food  
and Agriculture



# Student Reading

*Antics! An Alphabetical Anthology* by Catherine Hepworth, The Putnam Publishing Group, 1996.

*An Ant Colony* by Heiderose and Andreas Fischer-Nagel, The Lerner Publishing Group, 1989.

*Ant Cities* by Arthur Dorros, Harper Collins Children's Books, 1988.

*Ant* by Michael Chinery, Troll Communications L.L.C., 1991.

*If You Were an Ant (First Facts)* by S.J. Calder, Silver Burdett Press, 1995.

*One Hundred Hungry Ants* by Elinor J. Pinczes, Houghton Mifflin Co., 1993.

*The Fascinating World of Ants* by Jose M. Parramon, Barron's Educational Series, Inc., 1991.

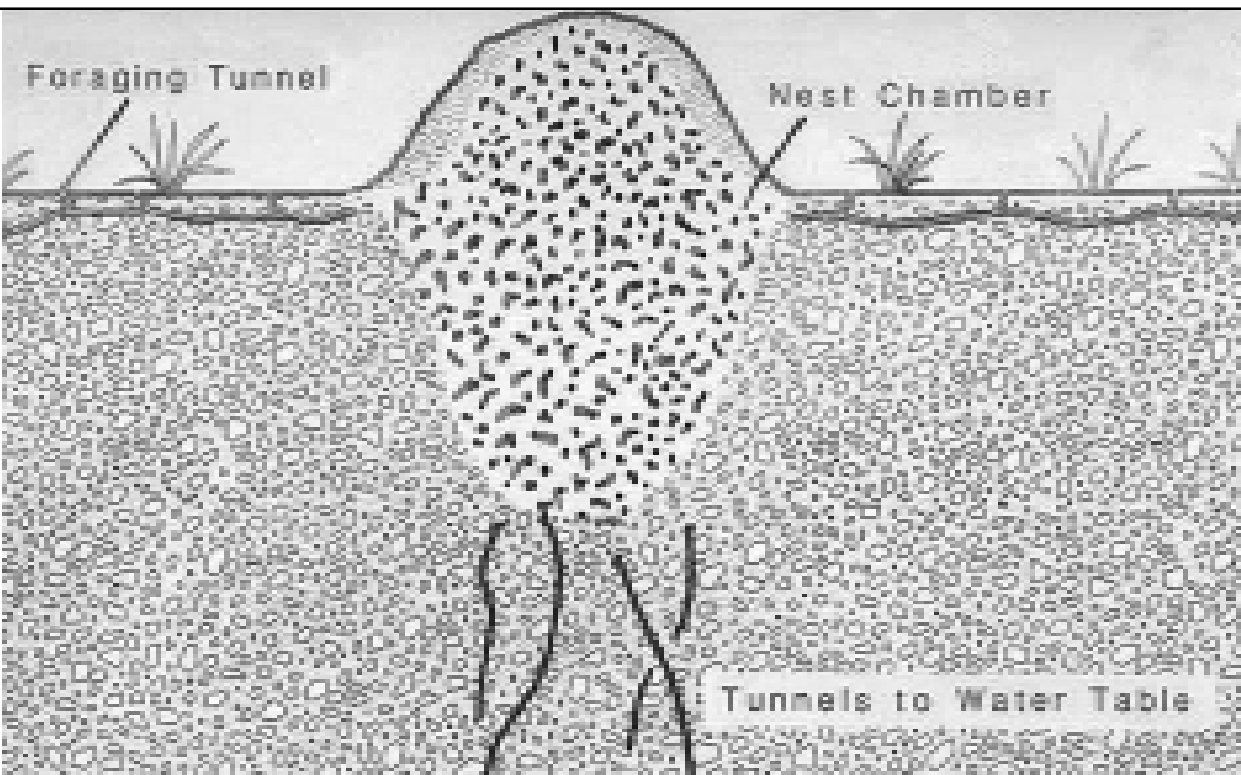
*Those Amazing Ants* by Patricia Brennan Demuth, Simon & Schuster Children's Books, 1994.

*Two Bad Ants* by Chris Van Allsburg, Houghton Mifflin Co., 1988.



## DID YOU KNOW...

A Red Imported Fire Ant queen can live six years.



A cross section of a Red Imported Fire Ant mound.



## Resources/Acknowledgements

California Department of Food and Agriculture

California Foundation for Agriculture in the Classroom

*First Aid for Bites*, Mayo Foundation for Medical Education and Research

*First Aid for Children for Fire Ant Bites*, Children's Medical Center of Dallas

FORMIS: A Master Bibliography of Ant Literature, USDA Agricultural Research Service

Social Insects Worldwide, American Museum of Natural History

Texas A&M University Fire Ant Project

*Imported Fire Ants*, by Timothy Lockley USDA/APHIS/PPQ, University of Minnesota IPM World Textbook



You can obtain more information, order more materials, or download this and other lesson plans online at [www.fireant.ca.gov](http://www.fireant.ca.gov) or [www.cfaitc.org](http://www.cfaitc.org).



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